

A.) AMENDMENTS TO THE CLAIMS:

1. (currently amended) A method of operating a service network connected to ~~an~~ a high-speed access network infrastructure in which layer one and layer two resources are shared with other service networks, comprising the steps of:

receiving, at a tunneling endpoint in the service network, an encapsulated packet transmitted from an access network device connected to the high-speed access network infrastructure by an upstream and a downstream channel assigned by the high-speed access network infrastructure, the network device having a source address assigned by the service network and related based on a subscription to services offered by the service network;

de-encapsulating the packet to reveal the source address; and

if the access-network-device source address is associated with an authorized subscriber to services offered by the service network, forwarding the packet to a destination network address indicated in the packet, thereby packet after said de-encapsulating, thereby effectuating the services offered by the service network.

2. (previously presented) The invention of claim 1 wherein the tunneling endpoint is a router and the packet is de-encapsulated using a layer three tunneling technique.

3. (previously presented) The invention of claim 2 wherein the layer three tunneling technique is IP within IP encapsulation.

4. (previously presented) The invention of claim 2 wherein the layer three tunneling technique is minimal IP encapsulation.

5. (previously presented) The invention of claim 1 wherein the tunneling endpoint is a layer two tunneling network server and the packet is de-encapsulated using a layer two tunneling technique.

6. (previously presented) The invention of claim 5 wherein the layer two tunneling technique is L2TP.

7. (currently amended) The invention of claim 1 wherein the service networks utilize the Internet Protocol and wherein the source and destination addresses are Internet Protocol addresses.

8. (currently amended) The invention of claim 1 wherein the service network is operated by an Internet Service Provider different from an entity operating the high-speed access network infrastructure.

9. (previously presented) The invention of claim 8 wherein the service networks are operated by different Internet Service Providers.

10. (previously presented) The invention of claim 8 wherein the service networks offer access to different Internet Protocol-based services.

11. (previously presented) The invention of claim 1 wherein the access network infrastructure comprises a hybrid fiber coaxial network.

12. (previously presented) The invention of claim 1 wherein the tunneling endpoint is one of a plurality of tunneling endpoints in the service network, each having a virtual interface with a network address, and wherein the encapsulated packet is addressed to the network address of the virtual interface.

13. (currently amended) A method of operating a network access device connected to ~~an~~ a high-speed access network infrastructure connected to a plurality of service networks, comprising ~~the steps of:~~

creating a packet related to services offered by a service network, the packet having a source address assigned by the service network to the network access device and a first destination address;

encapsulating the packet by including a source address assigned by the high-speed access network infrastructure to the network access device and a second destination address corresponding to a tunneling endpoint of the service network; and

tunneling the packet, after said encapsulating, to a the tunneling endpoint in the service network via a downstream channel of the high-speed access network infrastructure so that the tunneling endpoint can de-encapsulate the packet and forward the packet to it's the first destination ~~network~~ address, thereby effectuating the services offered by the service network.

14. (previously presented) The invention of claim 13 wherein the tunneling endpoint is a router and the packet is encapsulated using a layer three tunneling technique.

15. (previously presented) The invention of claim 14 wherein the layer three tunneling technique is IP within IP encapsulation.

16. (previously presented) The invention of claim 14 wherein the layer three tunneling technique is minimal IP encapsulation.

17. (previously presented) The invention of claim 13 wherein the tunneling endpoint is a layer two tunneling network server and the packet is encapsulated using a layer two tunneling technique.

18. (previously presented) The invention of claim 17 wherein the layer two tunneling technique is L2TP.

19. (currently amended) The invention of claim 13 wherein the service networks utilize the Internet Protocol and wherein the source and destination addresses are Internet Protocol addresses.

20. (currently amended) The invention of claim 13 wherein the service network is operated by an Internet Service Provider different from an entity operating the high-speed access network infrastructure.

21. (previously presented) The invention of claim 20 wherein the service networks are operated by different Internet Service Providers.

22. (previously presented) The invention of claim 20 wherein the service networks offer access to different Internet Protocol-based services.

23. (previously presented) The invention of claim 13 wherein the access network infrastructure comprises a hybrid fiber coaxial network.

24. (previously presented) The invention of claim 13 wherein the tunneling endpoint is one of a plurality of tunneling endpoints in the service network, each having a virtual interface with a network address, and wherein the encapsulated packet is addressed to the network address of the virtual interface.